

C L A I M S

1.- Method for producing titanium composite parts, by means of casting, which comprises the following operational stages:

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- Obtaining a titanium composite reinforcement material.
- Obtaining a consumable ingot of titanium or non-reinforced titanium alloy.
- Simultaneous melting of the reinforcement material and of the consumable ingot.
- Casting of the melted composite in the corresponding mould in order to produce the composite piece in its final shape and dimensions.

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2.- Method for producing titanium composite parts, by means of casting, according to claim 1, characterised in that the reinforcement material is obtained by means of the self-propagated high-temperature synthesis method.

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3.- Method for producing titanium composite parts, by means of casting, according to claim 1, characterised in that the reinforcement material is a composite with titanium borides and/or carbides distributed in a titanium or titanium alloy matrix.

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4.- Method for producing titanium composite parts, by means of casting, according to claim 1, characterised in that the titanium composite which constitutes the reinforcement material has between 30-70% by weight of titanium boride and/or carbide, dispersed in titanium or titanium alloy.

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5.- Method for producing titanium composite parts, by means of casting, according to claim 1, characterised in that the consumable ingot is of titanium or titanium alloy.

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6.- Method for producing titanium composite parts, by means of casting, according to claim 1, characterised in that the consumable ingot is a cp-Ti grade 1, cp-Ti grade 2, cp-Ti grade 3, cp-Ti grade 4, Ti-0.05Pd, Ti-6Al-4V, Ti-5Al-2.5Fe,

Ti-5Al-2.5Se, Ti-6Al-2Sn-4Zr-2Mo-0.1Si, Ti-5.8Al-4Sn-3.5Zr-0.5Mo-0.7Nb-0.35Si-0.06C, Ti_3Al , Ti-14Al-11Nb, Ti_2AlNb , γ TiAl, or Ti(22-23)Al-(25-26)Nb(at%) alloy.

7.- Method for producing titanium composite parts, by means of casting,
5 according to claim 1, characterised in that the reinforcement material, which may
be a single piece or divided up, and the consumable ingot are united prior to
melting by a welding procedure.

8.- Method for producing titanium composite parts, by means of casting,
10 according to claim 1, characterised in that the reinforcement material, which may
be a single piece or be divided up, and the consumable ingot are united prior to
melting by mechanical means.

9.- Method for producing titanium composite parts, by means of casting,
15 according to claim 1, characterised in that the reinforcement material, which may
be a single piece or be divided up, is inserted in one or more holes made in the
consumable ingot.

10.- Method for producing titanium composite parts, by means of casting,
20 according to claim 1, characterised in that the melting is done by the vacuum
electric arc and/or vacuum induction melting method.

11.- Method for producing titanium composite parts, by means of casting,
according to claim 1, characterised in that the casting in moulds is done by means
25 of a centrifuging or gravity filling process.

12.- A titanium composite part characterised in that it is produced by
casting starting from a titanium composite reinforcement material and a
consumable ingot of titanium or non-reinforced titanium alloy.

30 13.- A titanium composite part, according to claim 12, characterised in that
the reinforcement material is a composite with titanium borides and/or carbides,
dispersed in titanium or titanium alloy.

14.- A titanium composite part, according to claim 12, characterised in that it has a percentage of titanium boride and/or carbide above 0% and below 70% by weight, dispersed in titanium or titanium alloy.

5 15.- A titanium composite part, according to claim 12, characterised in that the reinforcement material is obtained by means of the self-propagated high-temperature synthesis technique.

10 16.- A titanium composite part, according to claim 12, characterised in that the titanium composite which constitutes the reinforcement material has 30-70% by weight of titanium boride and/or carbide, dispersed in titanium or titanium alloy.

17.- A titanium composite part, according to claim 12, characterised in that the consumable ingot is of titanium or titanium alloy.

15 18.- A titanium composite part, according to claim 12, characterised in that the consumable ingot is a cp-Ti grade 1, cp-Ti grade 2, cp-Ti grade 3, cp-Ti grade 4, Ti-0.05Pd, Ti-6Al-4V, Ti-5Al-2.5Fe, Ti-5Al-2.5Sn, Ti-6Al-2Sn-4Zr-2Mo-0.1Si, Ti-5.8Al-4Sn-3.5Zr-0.5Mo-0.7Nb-0.35Si-0.06C, Ti₃Al, Ti-14Al-11Nb, Ti₂AlNb, γ TiAl, or Ti(22-23)Al-(25-26)Nb(at%) alloy.

19.- A titanium composite part, according to claim 12, characterised in that the reinforcement material, which may be a single piece or divided up, and the consumable ingot are united, prior to melting, by a welding procedure.

25 20.- A titanium composite part, according to claim 12, characterised in that the reinforcement material, which may be a single piece or divided up, and the consumable ingot are united, prior to melting, by mechanical means.

30 21.- A titanium composite part, according to claim 12, characterised in that, prior to melting, the reinforcement material, which may be a single piece or divided up, is inserted into one or more holes made in the consumable ingot.

- 22.- A titanium composite part, according to claim 12, characterised in that the melting is done by means of the vacuum induction melting and/or vacuum electric arc melting method.
- 5 23.- A titanium composite part, according to claim 12, characterised in that the casting in the moulds is done by means of a centrifuging or gravity filling method.